FIG. 9: Prolonged hypoglycemic effect on fasting blood glucose levels in *ob/ob* mice treated with 150 and 50 mg/kg polysaccharides fraction from *Panax quinquefolius* berry extract. After 5 days (Day 15), 10 days (Day 20), and 15 days (Day 25) cessation of treatment, fasting blood glucose levels were significantly lower compared to the vehicle group.

FIG. 10A, FIG. 10B and FIG. 10C: Intraperitoneal glucose tolerance (IPGTT) test in *ob/ob* mice before and after a 12-day treatment with *Panax ginseng* berry extract. FIG. 10A shows vehicle-treated group. FIG. 10B shows 50 mg/kg extract-treated group. FIG. 10C shows 150 mg/kg extract-treated group, which has a significantly higher rate of glucose disposal at 30, 60 and 120 min.

FIG. 11A and FIG. 11B: IPGTT in adult *db/db* mice before (Day 0) and after a 12-day treatment with *Panax ginseng* berry extract or vehicle. (FIG. 11A) shows the 150 mg/kg extract-treated group, which has a significantly higher rate of glucose disposal at 30, 60 and 120 min. (FIG. 11B) shows the vehicle-treated group.

FIG. 12A and FIG. 12B: IPGTT in *ob/ob* mice before and after a 12-day treatment with *Panax quinquefolius* berry extract. FIG. 12A shows the vehicle treated group. FIG. 12B shows that mice treated for 12 days with 150 mg/kg of extract have a higher rate of glucose disposal at 60 and 120 min after 12 days of treatment vs. Day 0.

FIG. 13A, FIG. 13B and FIG. 13C. IPGTT in lean and *ob/ob* mice before and after a 12-day treatment with ginsenoside Re. FIG. 13A shows 20 mg/kg ginsenoside Re treatment in lean mice. FIG. 13B shows vehicle-treated *ob/ob* mice. FIG. 13C shows 20 mg/kg ginsenoside Re treatment in *ob/ob* mice, with a significantly higher rate of glucose disposal at 60 and 120 min compared to vehicle group.

FIG. 14A and FIG. 14B: IPGTT in *ob/ob* mice before (Day 0) and after a 10-day treatment with polysaccharides fraction from *Panax quinquefolius* berry extract. FIG. 14A shows 150 mg/kg polysaccharides-treated mice. FIG. 14B shows 50 mg/kg

polysaccharides-treated mice. There is a significantly higher rate of glucose disposal based on measurement of area under the plasma concentration curve (AUC).

FIG. 15A and FIG. 15B: Effect of *Panax ginseng* berry extract on whole body glucose disposal during hyperinsulinemic-euglycemic clamps in *ob/ob* mice and lean littermates. Blood glucose levels (FIG. 15A) and steady state glucose infusion rates (FIG. 15B) obtained from the average rates of 120 min hyperinsulinemic euglycemic clamps were determined after 12-day treatment with 150 mg/kg extract.

FIG. 16A and FIG. 16B: Effects of *Panax ginseng* berry extract on body weight in *ob/ob* mice. FIG. 16A shows that there is a tendency to increase in body weight from Day 0 to Day 12 in mice received vehicle. 50 mg/kg extract ceases body weight increase. After 12 days of treatment with 150 mg/kg extract, body weight reduces significantly. FIG. 16B shows that after the cessation of 150 mg/kg extract treatment, *ob/ob* mice gradually regains body weight similar to vehicle-treated mice.

FIG. 17: Effects of *Panax ginseng* berry extract on body weight changes in adult db/db mice. Mean body weight on Day 0 is adjusted to 0%. There is a tendency to increase body weight from Day 0 to Day 12 in mice received vehicle. After 5 days and 12 days of 150 mg/kg extract treatment, body weight reduces significantly.

FIG. 18: Effects of *Panax ginseng* berry extract on body weight changes in adult lean littermates. Mean body weight on Day 0 is adjusted to 0%. After 5 days and 12 days of 150 mg/kg extract treatment, body weight reduces significantly.

FIG. 19: Effects of *Panax quinquefolius* berry extract on body weight in *ob/ob* mice. After 12 days of treatment with 150 mg/kg extract, body weight was reduced.

FIG. 20: Effects of polysaccharides fraction on body weight changes in *ob/ob* mice. While there is a tendency to increase in body weight from Day 0 to Day 10 in mice received vehicle, 150 mg/kg and 50 mg/kg polysaccharides treatment do not affect body weight changes.

FIG. 21: Effect of polysaccharides on body weight changes in *ob/ob* mice. Compared to vehicle group, 150 mg/kg and 50 mg/kg polysaccharides administration do not affect body weight changes during and after treatment.

FIG. 22: Effects of *Panax ginseng* berry extract on energy expenditure in *ob/ob* mice. After 12 days of treatment with 150 mg/kg extract, there was a significant increase in energy expenditure of the extract-treated group compared to the vehicle-treated group.

FIG. 23: Effects of *Panax ginseng* berry extract on energy expenditure in *ob/ob* mice. After 12 days of treatment with 150 mg/kg extract, there was a significant decrease in plasma cholesterol levels of the extract-treated group compared to the vehicle-treated group.

DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

Currently, standard drug therapy for type 2 diabetes has a number of limitations, such as adverse effects and high rates of secondary failure. This has led to the search for alternative therapies that may have a similar degree of efficacy without the troublesome side effects associated with the conventional drug treatment. The inventors of the present invention envision that the identification of compounds from medicinal plants with anti-hyperglycemic and/or anti-obese activities may provide an opportunity to develop a novel class of anti-diabetic agents. Yet further, the compounds of the present invention may function as adjuvants in combination with other anti-diabetic agents.

Today, the number of patients with type 2 diabetes is growing in epidemic proportions throughout the world. Considering the heterogeneity of this disease, and the limitations of current therapies, such as high secondary failure rates, and side effects, there is an urgent need to explore new classes of anti-diabetic agents. In traditional Chinese and Japanese medical formulations, it is the root of *Panax ginseng* that was used for the management of diabetes. The present inventors demonstrate that other portions of the ginseng plant, such as the berry, also contain ginsenosides, but with a different